NOAA REPORT

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Running With the Currents

NOAA, DOC Employees Race For the Cure

Iris Harris/DOC

Under the banner "Running With the Currents," 225 NOAA and DOC employees, contractors, family members and friends participated in the Washington, D.C., leg of the National Race for the Cure June 5 to raise money for breast cancer research and education.

U.S., Canadian Scientists Establishing First Observatory on Subsea Volcano

NOAA researchers and U.S. and Canadian university scientists have taken another step toward establishing a permanent observatory on Axial Volcano, an active volcano on the seafloor 250 miles off the coast of Oregon.

Using two ships and a remotely operated diving submersible called "ROPOS" from mid-June through mid-July, the scientists recovered instruments put in place on the volcano last summer, performed experiments to measure the impacts of a volcanic eruption there in early 1998 and deployed new instruments to document continuing changes on the volcano. The scientists are particularly interested in the effect of these changes on the newly discovered world of microorganisms living beneath the surface of Axial's summit.

The goal of the multi-year project—called NeMO, short for New Millenium Observatory, and led by scientists from the Vents Program at NOAA's Pacific Marine Environmental Research Laboratory in Newport, Oreg., and Seattle, Wash.—is to make multiple

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Fisheries Service Helps Create New Coastal Marshland

—By Gordon Helm

The National Marine Fisheries Service is nearing completion of a $400,000 project to create new marshland in Little Vermillion Bay, La., by constructing 35 acres of islandlike terraces in the bay in a unique chevron pattern to slow sediment-laden waters, allowing further sediment to accumulate.

Sediment is dredged from the shallow bay bottom and arranged in long, slender terraces, which will be planted with smooth chord grass common to the area, providing

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Bring on the fish!

Iris Harris/DOC

Hoover Building cafeteria worker Julia Hill readies steamed shrimp for NOAA's annual Fish Fry. *See pages 4 and 5 for more.*

Nicole Nasby/U. Of Oregon

The remotely operated vehicle ROPOS is launched from the research vessel Thomas G. Thompson.

Sub Dives on Axial Volcano

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observations at Axial Volcano over a number of years to document changes in this highly dynamic underwater environment.

"NeMO is opening a scientific window on a fantastic, newly discovered world below the surface of the seafloor inhabited by ancient forms of bacteria," said Stephen R. Hammond, who heads the laboratory's Ocean Environment Research Division.

Axial Volcano and other areas of hydrothermal activity on the seafloor are known to have significant impacts on the chemistry, biology and deep circulation of the oceans.

Volcanically driven hot springs, or hydrothermal vents, in these regions support unique communities of tubeworms, crabs and other animals that have adapted to the incredibly harsh environment surrounding areas of seafloor volcanic activity, deriving their energy for living from chemosynthetic bacteria that metabolize elements and compounds discharged into the water by the vents.

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Chesapeake Bay Nowcasts and Forecasts Now Available On the Internet for Free

—By Susan Harrison

In a demonstration project running through July 31, anyone with an Internet connection can now access nowcasts and forecasts of environmental conditions in the Chesapeake Bay and nearby areas via a prototype Internet site at http://cmdp.wsicorp.com.

The public can find out the current or predicted weather conditions, determine the speed and direction of surface winds or check out the latest radar image of clouds and lightning.

Plus, thanks to a unique partnership of NOAA, several universities and a commercial weather vendor, this information is now available to the general public at no cost.

"The site is terrific!" says boater Joyce Cantrell.

In addition to standard NOAA products, such as text copies of the latest NOAA weather forecasts, several experimental products of the National Weather Service and the National Ocean Service are also available during the demonstration/evaluation period. These include forecasts of high-resolution winds and water levels in the bay and forecasts of water temperature, salinity and currents for the Northwest Atlantic.

Daily observations of sea surface heights from the TOPEX/Poseidon satellite have been added, made possible by a cooperative program with Princeton University. Users can now see forecasts of the locations and intensities of the cold eddies and warm pools that form along the path of the Gulf Stream, which are of great importance to both commercial and recreational fishermen.

So far, the response from users has been enthusiastic.

"I viewed all the pages, and this is an awesome site that puts numerous critical weather products at the fingertips of search and rescue controllers," said Coast Guard Lt. Cdr. Mark Rizzo, chief of the Atlantic Area Command Center in Portsmouth, Va.

Steve Zubrick, science operations officer at the Sterling, Va., Weather Service Forecast Office, agreed. "Forecasters here have seen the model forecast small-scale features like convergence zones along the western shore of Chesapeake Bay and channeled wind flow, which creates a zone of higher wind speed blowing up the bay."

"The site is terrific," said recreational boater Joyce Cantrell of Solomons, Md. "As a boater who travels down the coast in the winter and back in the spring each year, as well as around the bay in the summer, I haven't found a more concise site, presented as clearly, anywhere else.

"It was of particular interest to me since I know someone who was leaving Norfolk on his way to Boston, out in the ocean in his 49' boat.

"I could follow his progress and weather conditions at the same time. The images are very clear, and the site is easy to use. Keep up the great work!" Cantrell said

On an experimental basis, the Chesapeake Bay water level forecasts include the forcing effects of tides, winds and fresh water river inputs, which the National Ocean Service is in the process of implementing operationally.

Experimental predictions of currents and waves are expected to be available in the bay during a second demonstration in February and March of 2000.

Kurkul Heads NE Fisheries. Patricia Kurkul, an 18-year NOAA employee and an expert on fishery management laws, is the new Northeast regional administrator for the National Marine Fisheries Service.

Millard Directs Human Resources. Regina Millard is the new director of the NOAA Human Resources Management Office. Millard most recently was director for human resources at the National Imagery and Mapping Agency.

News Briefs

AWIPS Wins Top Award. The Advanced Weather Interactive Processing System, a cornerstone of the modernization of the National Weather Service, took top honors in the environment, energy and agriculture category of the Smithsonian Institution-*Computerworld Magazine* annual awards honoring organizations using technology in innovative ways to benefit society. AWIPS was the only federal program honored.

Ozone Loss—Humans to Blame. NOAA and university scientists confirm most gases responsible for stratospheric ozone depletion are produced by human activities and are not naturally occurring in the atmosphere. Writing in *Nature* June 24, James Butler of NOAA's Climate Monitoring and Diagnostics Laboratory in Boulder, Colo., and others show that air trapped in the polar snowpack in Antarctica and Greenland in the late 19th and early 20th centuries contains no major ozone-depleting gases.

Roger L. Parsons/NOAA

Scientists Converge on Pacific Island. *NOAA and other scientists from around the world converged on the tiny island of Nauru in the tropical western Pacific through mid-July to investigate how the tropics affect weather and climate worldwide. Scott Smith of the Brookhaven National Laboratory services an Atlas climate buoy, while the NOAA Ship Ron Brown stands by.*

Air Pollution: A National S.O.S.

Air pollution affects the entire country. It damages crops in the Midwest and the South and forests in the Northeast. Everywhere, it worsens the conditions of asthma sufferers and others with respiratory problems. It ruins scenic vistas from New York City to the Great Smokey Mountains to Southern California.

This summer, scientists from government and academia are pooling their resources in an air quality study of conditions in the southern states that should provide a better understanding of the basic chemical, meteorological and transport processes that cause air pollution nationwide.

The Southern Oxidants Study is a cooperative effort among universities and federal, state and local government environmental and regulatory agencies to investigate air pollution from mid-June to mid-July. Operating out of Nashville, Tenn., scientists will investigate the processes responsible for the formation of ozone pollution and fine particulate matter that may be a factor in many health-related problems, as well as crop and forest damage. This research will provide critical background information to policy makers who are developing solutions to air pollution problems.

Using planes, helicopters and air monitoring stations located throughout the South, scientists will collect air samples to assess the physical and chemical characteristics of fine particulate matter and ozone.

"The combined activities of this study provide an unparalleled opportunity to describe the production and distribution of ozone and particulate matter throughout the Southeast with a level of detail that has hitherto not been possible," says project chief scientist James Meagher, of NOAA's Aeronomy Laboratory in Boulder, Colo.

—Barbara McGehan

Focus On...

the 24th Annual

NOAA

Well-fed volunteers make happy workers. The NOAA Fish Fry is a self-supporting event that relied this year on nearly 100 employee volunteers working in shifts at set up, registration, cooking, food service and clean up, augmented by a small paid staff. Sponsors included SATO Travel, the National Aquarium, the NOAA-NIH Welfare and Recreation Association and the Wolf Trap Foundation, which provided door prizes ranging from t-shirts to performance tickets.

Delicately fried catfish was just one of a dozen varieties of freshwater fish and seafood served.

Fish! A favorite of connoisseurs of all ages.

Fish Fry

Smiling faces are always the mark of a successful Fry.

The weather cooperated, drawing diners to the cafeteria's courtyard.

One Big Office Party!

Washington, D.C. Over 850 NOAA and DOC employees were joined by family, friends and colleagues from other agencies, the Hill and constituent groups at the 24th annual NOAA Fish Fry, held in the cafeteria of the Herbert C. Hoover Building June 9, making this the largest Fish Fry ever! "As soon as the cafeteria closed at 2 p.m., we had volunteers setting up tables, shucking corn and cooking food for what has become the largest office party in the Department of Commerce, and possibly in all of government," said Fish Fry co-organizer Robert Hansen of NOAA's Office of Public and Constituent Affairs.

All photos: Iris Harris/DOC.

The line dance has become a traditional way to work off one too many helpings of fish and top off the evening's fun.

Half a Century of Service. John Wilkerson, an oceanographer with the National Environmental Satellite, Data and Information Service's Office of Research and Applications, completed 50 years of federal service in June. Wilkerson began his federal service at an apprentice mechanic at Bolling Field in 1943, served in both World War II and Korea, and left the government only long enough to graduate from the University of Maryland under the G.I. Bill. He joined NOAA in 1977. He has no immediate plans for retirement.

News Briefs

Two Win Atlantic Fisheries Award. The Atlantic States Fisheries Commission awarded its first annual Awards of Excellence to Scott Doyle and Paul Perra for contributions to the commission. Doyle is a special agent with the National Marine Fisheries Service Office of Law Enforcement in Brielle, N.J. Perra is a fishery biologist manager with the Fisheries Service Office for Intergovernmental and Recreational Fisheries in Silver Spring, Md.

McPhaden Wins Service Award. Michael McPhaden, a senior oceanographer with NOAA's Pacific Marine Environmental Research Laboratory in Seattle, Wash., has received the Seattle Federal Executive Board's public service award for his contributions to establishing the Tropical Atmosphere Ocean array, which led to the extraordinary predictions and monitoring of the 1998 El Nino.

Live from the Storm Prediction Center

Discovery Channel for NOAA

Discovery Channel news correspondent Forrest Sawyer (pictured) introduced five broadcasts on tornadoes live from the NOAA Storm Prediction Center in Norman, Okla., during the network's "Twister Week" series June 14-18. Joining Sawyer is the center's administrative officer, Peggy Stogsdale, who helped arrange Discovery's visit.

Rep. Frank Speaks at Diversity Session

Iris Harris/DOC

U.S. Representative Barney Frank (left) joined a panel discussion on "Honoring Our Diversity: Moving Toward Unity" at the Department of Commerce's program to commemorate Gay, Lesbian and Bisexual Awareness Month in the Hoover Building June 15. Joining Rep. Frank are Commerce GLOBE representative Jonathan Freilich (center) and Jerry Beat of the NOAA Office of Civil Rights.

Axial Expedition Ends mid-July

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"The species diversity of this deep, hot biosphere appears to be immense, and many of the organisms thrive near, and even above, 100 degrees Centigrade," Hammond said.

"Also intriguing is the fact that these bacteria appear to have a closer genetic relationship to humans than bacteria we come into contact with everyday. To top it off, these heat-loving bacteria, or thermophiles, have genetic and metabolic properties that have tremendous potential for creating new biotechnical and pharmaceutical products," he said.

The enzymes and metabolites that subseafloor bacteria produce could have applications ranging from new antibiotics to better laundry detergents. Enzymes from bacteria feeding on the nutrients in the super-heated waters are uniquely stable at high temperatures, allowing commercially valuable chemical reactions, such as DNA sequencing, to be performed more quickly and accurately.

Beginning June 20, scientists aboard the RV *Wecoma* towed instruments above the site to measure and sample seawater over the volcano.

Samples were examined by scientists in the ship's laboratory and prepared for further study ashore. The samples confirm that vigorous venting activity is continuing at the site and that the deep microbial biosphere under the volcano's surface is alive and well.

Wecoma is a 185-foot research vessel operated for the National Science Foundation by Oregon State University and contracted by the Vents Program.

The *Wecoma*-based scientists also retrieved instrument packages left moored at the site last year to measure ocean conditions, including ongoing hydrothermal activity, and deployed new instrument systems that will continue making measurements.

On June 21, *Wecoma* was joined by the RV *Thomas G. Thompson*, a 275-foot research vessel operated by the University of Washington, carrying the remotely operated vehicle ROPOS for complementary studies. Scientists aboard *Thompson* used cameras onboard ROPOS to guide the ROV, which remains tethered to the ship by a 3,500-meter cable.

In addition to photographing the NeMO site, ROPOS collected biological, rock and water samples and made extremely high-resolution bathymetric and sonar backscatter surveys.

ROPOS took water samples, sucked up bacteria and snail-like anthropods using a vacuum hose called a "slurp gun" and collected crabs and tube worms with a special articulating claw "grabber" for further study.

The *Thompson*-based scientists used ROPOS to sample fluids being discharged by the hydrothermal vents at the site, collected other instrument packages left previously and deployed new ones. They also mapped the plume of hydrothermal water still flowing over the site.

Wecoma returned to its homeport of Newport, Oreg., on July 1.

Thompson was scheduled to return to Astoria, British Columbia, July 16.

Seafloor Vents May Hold Key to All Life

Since they were first discovered in the 1970's, hydrothermal vents have fascinated scientists, many of whom believe they hold the secret to the origin and evolution of life on this planet and possibly other planets. But the vent sites have been extremely difficult to study because of their depth and their remote locations along the Earth's mid-ocean volcanic ridges that ring the globe like seams on a baseball.

Axial Volcano is the most active volcano on the mid-ocean mountain range known as the Juan de Fuca Ridge, which forms the boundary where two of Earth's tectonic plates are moving slowly apart. Often when the plates move, subsea earthquakes occur, accompanied by volcanic eruptions of molten magma that expel super-heated, mineral-laden seawater percolating through the ridge. The temperature of this superheated water can exceed 400 degrees Centigrade, while the temperature of surrounding waters only ten feet away drops to 1.5 degrees!

As this superheated, mineral-rich seawater nears the cooler ambient water near the surface of the seafloor, the minerals precipitate out of the mix, forming mounds of minerals that look like chimneys, some 150 feet high! The bacteria that feed on the chemicals that spew from these chimneys and cracks in the seafloor form the base of the food chain for the tube worms, crabs and other chemosynthetic plants and animals that live in clusters on and near the discharges.

Scientists have also recently discovered that there is another parallel universe of microorganisms inhabiting the seabed even deeper below the surface. While even less is known about these organisms, some scientists believe these subsurface microbes may turn out to be the most widespread and prolific life form on the planet, rivaling in total mass all other life forms in the oceans and on the land surface of the planet!

Prahl Commands AMC, PMC. Rear Adm. Nicholas A. Prahl was sworn in as director of the NOAA Atlantic and Pacific Marine Centers June 24, relieving Rear Adm. John C. Albright, who retired after 31 years of service.

Rowe is New *Oregon II* Skipper. James Rowe, a civilian mariner in the Office of NOAA Corps Operations, is the new commanding officer of the NOAA Ship *Oregon II*, relieving Lt. Cdr. Steve Thompson.

News Briefs

Hammer Award Winners. Prestigious Hammer Awards, established by Vice President Gore to recognize innovative examples of reinventing government, have been awarded to the NEXRAD Hotline Time, based in Norman, Okla., for its real-time support for critical weather services and to the Goodland, Kan., Weather Service Forecast Office for streamlining operations and cutting costs while providing high-quality service to the public.

NOAA Videos Win Awards. *Forecasting the Future*, produced and narrated by John Kermond of the Office of Global Programs, received a Certificate of Creative Excellence at the International Film and Video Festival in Chicago. *After the Spill: Restoring an Estuary*, from the Office of Public and Constituent Affairs and Fisheries' Office of Habitat Conservation, won a Silver Star at the Houston International Film Festival.

Vermillion Bay

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stability for the sediment along with food and protection for fish and waterfowl. As sediment slowly accumulates, another 400 acres of marshland will be created over the next 20 years.

"Historically, terraces have been used as wind blocks in a checkerboard pattern. The chevron pattern in Little Vermillion Bay mimics the natural delta process," said John Foret, a graduate student and NOAA Fisheries employee who is overseeing the construction.

"These terraces were suggested by local landowners to help protect their properties from shoreline erosion," he said.

Foret said the terraces should slow down erosion in Little Vermillion Bay, which had been threatening to further breach the Gulf Intra Coastal waterway and allow salt water to flow into the waterway, jeopardizing adjoining wetlands.

Fishermen will benefit from the new terraces, Foret says, because edges of marshes are critical habitat for many marine species. The project is creating 38,000 linear feet of new marsh edge for fish and other species looking for protection and food.

To increase public awareness of the benefits of the project, NOAA Fisheries project managers used a helicopter and a boat from an area wildlife refuge to provide four Lafayette, La., area television and print reporters with both fish- and bird's-eye views of a habitat restoration project as it neared completion.

"Reporters need to see a project from both the air and water, and have fisheries experts explain what they are seeing to be able to tell the whole story," said Tim Osborn, the NOAA Restoration Center's program coordinator for the Coastal Wetlands Planning, Protection and Restoration Act, commonly called the Breaux Act.

The Breaux Act task force, which includes five federal agencies and the state of Louisiana, works to protect and restore valuable Louisiana wetlands, which are disappearing at the rate of 25 square miles a year.

Following the recent media tour, for example, the two Lafayette television reporters produced positive news stories for their 5 and 6 p.m. newscasts, promoting the benefits of the habitat restoration work, complete with aerial video footage and pictures of the dredge as it scooped up sediment from the bay.

The area's largest newspaper, the Lafayette Advertiser, also carried a story and picture.

"Providing opportunities for reporters helps us with local officials and residents who may be affected by our restoration projects," said NOAA Fisheries' Terry McTigue, who heads up the Little Vermillion project in Louisiana.

"The more they know, the easier our job is to explain the benefits they'll ultimately see from our habitat restoration work," he said.

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